number of flag bits, the states of which are the same for all packets, a second predetermined number of data bits, the states of which vary depending upon the positions of the control switches and at least one checksum bit.

12. (Amended) The communication system as recited in claim 1 wherein the receiver includes a software derived phase-locked loop for synchronization of the decoder with the received stream of packets.

A marked copy of claims 1 and 12 showing the material added to each of these claims with underlining is attached hereto.

REMARKS

After the foregoing amendment, claims 1-12, as amended, are active in the present application. Claims 1 and 12 have been amended in order to more particularly point out and distinctly claim the subject matter which the Applicants regard as the invention. No new matter has been added to the application as a result of the amendment of claims 1 or 12.

In the Office Action, claims 1-12 were rejected under 35 U.S.C. § 112 as being indefinite. The Examiner found that having a predetermined number of data bits as called for in claim 1 is contradictory to the subsequent statement of having varying data bits. Claim 1 has been amended to clarify that each packet includes a first predetermined number of flag bits, the states of which are the same for all packets and a second predetermined number of data bits, the states of which vary depending upon the positions of the control inputs. It is respectfully submitted that amended claim 1 is in full compliance with 35 U.S.C. § 112 and it is therefore requested that the rejection be withdrawn.

Claim 1 was rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 4,334,221 (referred to as "Rosen"). It is the position of the Examiner that the Rosen patent discloses a wireless remote control system for a toy vehicle which utilizes a Manchester packet encoding scheme including biphase encoded bits having a fifty percent (50%) duty cycle where one binary state is defined by two transmit elements of a bit being the same and another binary state is defined by two transmit elements of a bit being opposite. The Examiner further states that the packets are uniformly encoded as having a first predetermined number of flag bits,

a second predetermined number of data bits that with varying values depending on the selected steering and speed and at least one checksum bit. For the reasons as set forth below, the Applicants respectfully traverse the rejection of claim 1 as well as dependent claims 3, 4, 9, 10 and 11 which are discussed by the Examiner but not formally rejected.

The Rosen patent discloses a radio controlled system for a multi-controller, multi-vehicle, independently controlled toy vehicle system. In the Rosen system, each of a plurality of control devices or control units is used for controlling one of a plurality of toy vehicles, apparently using the same frequency. In order to permit multiple separate controllers to control multiple separate toy vehicles utilizing the same frequency, the transmitters of the Rosen patent repetitively transmit bursts of command signals which are received in each of the plurality of toy vehicles. As shown in Fig. 4, each of the command signals includes a start pulse followed by a two bit identification code, six bits of steering data, five bits of speed data and a single parody bit. As observed by the Examiner, the digital bits are encoded in "Manchester Code" (see Fig. 5) where a logical zero consists of positive and negative alteration in either order and a logical one employs a single positive or negative alteration. As shown in Fig. 4, each command signal has a duration of approximately 2.5 milliseconds.

As shown in Figs. 2 and 3, the command signals are asynchronously transmitted as a series of repetitively radio frequency command bursts with each burst having a burst time (approximately 2.5 milliseconds) with each command burst being separated by quiescent periods at least ten times as long as the burst time. In the example given in the patent specification when a command burst occupies about 2.5 milliseconds, the quiescent time between bursts occupies 97.5 milliseconds. In this manner, there is only a 2.5 percent chance of the burst period from one of the transmitters coinciding with the burst period from one of the other transmitters. If command bursts from two transmitters occur at the same time, both command bursts are rejected by all of the toy vehicle receivers. In order to avoid a lengthy loss of control, the identity code selected in each command signal causes the command burst for each vehicle to be transmitted at slightly different burst repetition frequencies. Thus, for each controller the period of the command burst generated will differ from the period of every other command burst depending upon the identity code within the command signal. Each toy vehicle receives and at least partially decodes all of the command bursts. Each toy vehicle has an associated identity code which is compared to the identity code of each received command signal. If the identity codes

do not match the received command signal is ignored. If the identity codes match, then the toy vehicle executes the steering and speed commands of the received command signal.

The present invention comprises a communication system for transmitting control signals from a remote control unit to a toy vehicle based upon the position of control inputs of the remote control unit. The remote control unit includes an encoder and a transmitter and the toy vehicle includes a receiver, decoder and actuators for controlling the operation of the toy vehicle in accordance with control signals received from the remote control unit. Unlike the Rosen patent, with the present invention the encoder within the remote control unit generates a continuous stream of control signal packets with each packet including a first predetermined number of flag bits, the states of which are always the same, a second predetermined number of data bits, the states of which vary depending upon the positions of the control inputs and at least one checksum bit. The stream of control signal packets are continuously transmitted by the transmitter within the remote control unit at a constant frequency. This a significant difference over the Rosen patent in which the command signals are periodically generated and periodically transmitted as individual command bursts with long quiescent periods therebetween.

Claim 1 has been amended to more particularly point out and distinctly claim that with the present invention the control signal packets are generated as a continuous stream and are continuously transmitted at a constant frequency. Accordingly, it is respectfully submitted that claim 1, as well as dependent claims 3, 4, 9, 10 and 11 are not anticipated by the Rosen patent and the rejection of these claims under 35 U.S.C. § 102(b) should be withdrawn.

Claims 2 and 5-8 were rejected under 35 U.S.C. § 103(a) as being unpatentable over the Rosen patent. It is the position of the Examiner that the Rosen patent teaches the claimed limitations of each of these claims without reciting the exact arrangement of the packet structure as claimed. The Examiner believes that the packet size and structure and bit arrangement are considered to be an obvious matter of design choice well within the capabilities of those skilled in the art.

Claims 2 and 5-8 depend from claim 1, as amended. For the reasons as set forth in detail above, claim 1 distinguishes patentably over the Rosen patent. It is therefore respectfully submitted that claims 2 and 5-8 also distinguish patentably over the Rosen patent at least by their dependency from claim 1.

Claim 12 was rejected under 35 U.S.C. § 103(a) as being unpatentable over the

Rosen patent in view of the excerpt from the Art of Electronics (referred to as the "AE reference"). The Examiner takes the position that the Rosen patent teaches the claimed limitations but does not teach using a digital phase-locked loop (PLL). The Examiner states that the AE reference teaches the application of a PLL circuit such as in wireless communication devices and therefore provides motivation for one to include a PLL in a circuit such as for pulse synchronization of signals from noisy sources. The Examiner concludes that it would have been obvious to one of ordinary skill in the art at the time the invention was made to include a PLL in the decoder of a receiving device as taught by the Rosen patent to ensure proper signal transmission and decoding. For the reasons as set forth below, the Applicants respectfully traverse the rejection of claim 12.

As discussed in detail above, the Rosen patent discloses a control system for repetitively generating radio frequency command bursts having a prescribed burst time separated by quiescent periods to establish a burst frequency. The command bursts are asynchronously generated for the purpose of avoiding overlap of command bursts from each of a plurality of individual remote control units. The period or length of the quiescent period for each remote control unit varies in a manner determined by the identity code associated with the toy vehicle being controlled. However, each toy vehicle receives each command burst.

There is no disclosure, teaching or suggestion in the Rosen patent regarding the use of a PLL. In fact, it is respectfully submitted that to incorporate a PLL within the toy vehicles of the Rosen patent system would be contrary to the teachings of the Rosen patent. Because each toy vehicle receiver is receiving command bursts from all of the remote control units at differing times throughout a given time period, to incorporate a PLL into the toy vehicle receiver would cause the PLL to continuously try to lock onto one or the other of the command bursts causing the PLL to never really become effective. Further, because each command burst is of a short duration (2.5 milliseconds) the control system of the Rosen patent would not lend itself to the use of a PLL because by the time the PLL would lock, the current command burst would be nearly completed and would be followed either by a long quiescent time or a different command burst from another remote control unit.

The Applicants have reviewed the AE article and it appears to disclose primarily analog, hardware implemented PLL circuits. The PLL employed in the present invention is a software derived digital phase-locked loop. This feature has been further emphasized by the

amendment made to claim 12. It is respectfully submitted that even if it were appropriate to incorporate a PLL in a control scheme of the type disclosed in the Rosen patent, there is no teaching or suggestion in either the Rosen patent or the AE reference regarding the use of a software derived digital PLL.

It is respectfully submitted that the Rosen patent not only does not teach or suggest the use of a PLL but, for the reasons as discussed above, teaches away from the use of a PLL. In the absence of a teaching or suggestion, the Examiner has failed to make a *prima facie* case of obviousness as required by MPEP § 2142.

In view of the foregoing amendment to claim 12 and the foregoing discussion, it is respectfully submitted that claim 12, as amended, distinguishes patentably over the combination of the Rosen patent and the AE reference.

The Applicants have reviewed the additional references cited by the Examiner but not used as a basis for rejecting any of the claims. The Applicants respectfully submit that the present claims, as amended, distinguish patentably over the additional references.

In view of the foregoing amendment and discussion, it is respectfully submitted that the present application, including claims 1-12, as amended, is in condition for allowance and such action is respectfully solicited.

Respectfully submitted,

STEPHEN WEISS et al.

12/3/02
(Date)

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Enclosure

MARKED UP VERSION OF AMENDED CLAIMS

1. (Amended) In a communication system for transmitting control signals from a remote control to a toy vehicle, the remote control including control switches, an encoder and a transmitter, the toy vehicle including a receiver, a decoder and actuators for controlling the operation of the toy vehicle in accordance with control signals received from the remote control, wherein the improvement comprises:

the encoder generating a continuous stream of control signal packets which are continuously transmitted at a constant frequency, each of the packets including a predetermined number of biphase encoded bits, each biphase bit being of the same predetermined width with a fifty percent duty cycle including two transmit elements with one binary state being defined as both of the transmit elements of a bit being opposite, each packet including a first predetermined number of flag bits, the states of which are the same for all packets, a second predetermined number of data bits, the states of which vary depending upon the positions of the control switches and at least one checksum bit.

12. (Amended) The communication system as recited in claim 1 wherein the receiver includes a software derived phase-locked loop for synchronization of the decoder with the received stream of packets.